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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,067	02/17/2004	Tai-su Park	5649-1192	2258
20792	7590	09/20/2005	EXAMINER	
MYERS BIGEL SIBLEY & SAJOVEC			PRENTY, MARK V	
PO BOX 37428			ART UNIT	
RALEIGH, NC 27627			PAPER NUMBER	
			2822	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/780,067

Applicant(s)

PARK ET AL.

Examiner

MARK PRENTY

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 31-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31-48 is/are allowed.
- 6) ☒ Claim(s) 1-4, 9, 10, 12-18 and 20 is/are rejected.
- 7) ☒ Claim(s) 5-8, 11 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date February 17, 2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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This Office Action is in response to the response filed on September 2, 2005.

Claims 1-4, 9, 10, 12-18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent 4,835,584 to Lancaster.

With respect to independent claim 1, Lancaster discloses a transistor (see the entire patent, particularly the Figs. 8A-8F disclosure) comprising: a vertical channel protruding from a substrate 80 (see Figs. 8A-8C and note the channel protrusions between trenches 86) including a source/drain region 91/92 junction between the vertical channel and the substrate; and a gate insulating layer 97 (see Fig. 8F) extending on a side wall of the vertical channel toward the substrate (note that gate insulating layer 97 extends along trench 95's (Fig. 8E) sidewalls in the direction in and out of the page, in a manner similar to Fig. 4's gate insulating layer 57) to beyond the source/drain region junction.

Claim 1 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 2, Lancaster's gate insulating layer 97 further extends on a top surface of the vertical channel (in a cross-section parallel to that of Figs. 8A-8C, in a manner similar to Fig. 4's gate insulating layer 57).

Claim 2 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 3, Lancaster's device further comprises a nitride layer 93 (see column 7, lines 1-6) on the side wall away from the substrate to beyond the gate insulating layer 97.

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Claim 3 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 4, Lancaster's nitride layer 93 is absent from beyond the source/drain region 91/92 junction (i.e., nitride layer 93 is shallower than the source/drain region junctions).

Claim 4 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 9, Lancaster's transistor further comprises a mask insulating layer 82-84 extending on a top surface of the channel (see column 6, lines 50-51).

Claim 9 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 10, Lancaster's mask insulating layer 82-84 comprises an etch stop nitride layer 83 and a pad oxide layer 82 (see column 6, lines 58-60, and column 3, lines 17-19).

Claim 10 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 12, Lancaster's mask insulating layer 82-84 comprises alternating oxide and nitride layers (see column 6, lines 58-60, and column 3, lines 17-19).

Claim 12 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

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With respect to independent claim 13, Lancaster discloses a transistor (see the entire patent, particularly the Figs. 8A-8F disclosure) comprising: a plurality of vertical channels protruding from a substrate 80 (see Figs. 8A-8C and note the channel protrusions between trenches 86) including respective source/drain region 91/92 junctions between the plurality of vertical channels and the substrate; and a plurality of insulating layers 97 (see Fig. 8F) extending on respective side walls of the plurality of vertical channels toward the substrate (note that gate insulating layer 97 extends along trench 95's (Fig. 8E) sidewalls in the direction in and out of the page, in a manner similar to Fig. 4's gate insulating layer 57) to beyond the respective source/drain region junctions.

Claim 13 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 14, Lancaster's transistor further comprises at least one planar region connected to the plurality of vertical channels (see Fig. 4).

Claim 14 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 15, Lancaster's plurality of gate insulating layers 97 further extends on respective top surfaces of the plurality of channels (in a cross-section parallel to that of Figs. 8A-8C, in a manner similar to Fig. 4's gate insulating layer 57).

Claim 15 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

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With respect to dependent claim 16, Lancaster's device further comprises a plurality of nitride layers 93 (see column 7, lines 1-6) extending on the respective side walls away from the substrate to beyond the plurality of gate insulating layers 97.

Claim 16 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 17, Lancaster's plurality of nitride layers 93 are absent from beyond the respective source/drain region 91/92 junctions (i.e., nitride layers 93 are shallower than the source/drain region junctions).

Claim 17 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 18, Lancaster's plurality of channels is separated by the plurality of nitride layers 93.

Claim 18 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

With respect to dependent claim 20, Lancaster's plurality of channels is oriented in a parallel configuration (see Fig. 4).

Claim 20 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster.

Claims 5-8, 11 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable over the prior art of record if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 31-48 are allowable over the prior art of record.

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The prior art of record does not disclose or suggest the allowable transistor taken as a whole, including the fin.

Registered practitioners can telephone the examiner at (571) 272-1843. Any voicemail message left for the examiner must include the name and registration number of the registered practitioner calling, and the Application/Control (Serial) Number. Technology Center 2800's general telephone number is (571) 272-2800.

Mark Prenty
Mark V. Prenty
Primary Examiner